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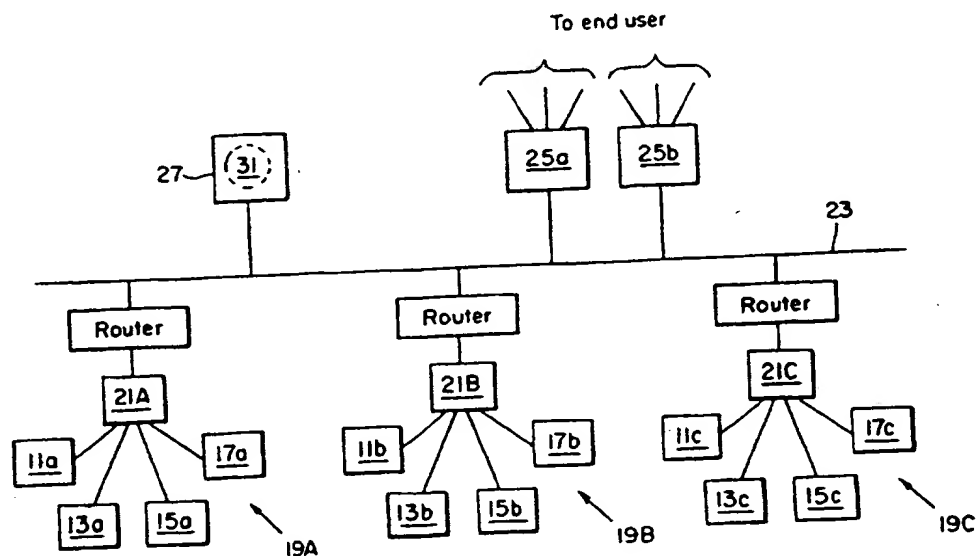
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## (57) Abstract

Computer network method and apparatus provides targeting of appropriate audience based on psychographic or behavioral profiles of end users. The psychographic profile is formed by recording computer activity and viewing habits of the end user. Content of categories of interest and display format in each category are revealed by the psychographic profile, based on user viewing of agate information. Using the profile (with or without additional user demographics), advertisements are displayed to appropriately selected users. Based on regression analysis of recorded responses of a first set of users viewing the advertisements, the target user profile is refined. Viewing by and regression analysis of recorded responses of subsequent sets of users continually auto-targets and customizes ads for the optimal end user audience.

## COMPUTER NETWORK AND METHOD FOR DETERMINING USER BEHAVIOUR

Background

In traditional print media, the term "agate" was  
5 originally used to refer to any information printed in  
columns 1.5 inches wide in 5 point type (e.g., stock  
quotes). Today, agate is used to refer to time-  
sensitive, reference information that is not read  
linearly. Examples are telephone listings, classified  
10 advertisements, weather reports, sports scores and  
statistics, market data, books and recordings in print,  
and television and film listings.

Some types of agate require continual updating in  
the short term, like stock quotes, while other types  
15 have a longer life, like travel information and business  
directories. The newspaper industry is one of the  
primary suppliers of agate. Newspapers provide listings  
of stock quotes, television and radio programming, film  
schedules, and classified ads. A second group of agate  
20 suppliers are book publishers. From travel guides to  
books in print, a wide variety of books provide agate  
information that changes monthly or yearly.

Although many types of agate are traditionally  
found in publications (e.g., newspapers, magazines, and  
25 books), all agate can be placed into large indexed  
databases. Because agate is non-linear reference  
material, it is often more efficient to search for agate  
in a database, than to scan columns of a newspaper.

One of the largest pools of databases and  
30 electronic media is found on The Internet. The World  
Wide Web (Web) is a two-year-old protocol used to create  
and publish documents on the Internet. Web documents

Summary of the Invention

The present invention uses agate information to determine the profile of a computer user, and in particular the behavioral or psychographic profile, as distinguished from the demographic profile, of a user. To accomplish this, the present invention provides (i) a data assembly for displaying customized agate information to a computer user, and (ii) a tracking and profiling member for recording user activity with respect to agate information displayed through the data assembly. Over time, the tracking and profiling member holds a history and/or pattern of user activity which in turn is interpreted as a user's habits and/or preferences. To that end, a psychographic profile is inferred from the recorded activities in the tracking and profiling member.

Further, the tracking and profiling member records presentation (format) preferences of the users based on user viewing activity. Preferences with respect to color schemes, text size, shapes, and the like are recorded as part of the psychographic profile of a user. In turn, the psychographic profile enables the data assembly to customize presentation (format) of agate information, per user, for display to the user.

In the preferred embodiment, the data assembly displays agate information and/or advertisements (combined in a common screen view or separately in respective screen views). The advertisements (stored in an advertisement module, for example) are displayed to users in accordance with the psychographic profile of the user.

The tracking and profiling member also records demographics of each user. As a result, the data assembly is able to transmit advertisements for display to users based on psychographic and demographic profiles of the user to provide targeted marketing.

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a result, the stock information is made searchable by variables such as price-earnings ratio, and the like.

The Sponsor Object categorizes advertisement or other sponsor provided information according to content and presentation, including colors used, size, shape, and whether audio and/or video components are involved. An advertiser profile building routine automates the process of identifying colors, size, shape, and whether video and/or audio are involved.

Also the Sponsor and User Objects track how many times each piece of advertisement information is shown to, is selected by and/or spawns a purchase by users. In other words, the Sponsor and User Objects track performance of sponsor provided information, especially advertisements. In the preferred embodiment, a performance routine employs regression techniques to provide performance reports. The performance routine may also be run (executed) remotely by suppliers of the advertisement information.

## Brief Description of the Drawings

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of preferred embodiments and the drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention.

Figure 1 is an overview of a computer network environment in which the present invention is employed.

Figure 2 is an overview of a general embodiment of the present invention.

Figures 3a-3g, 4a and 4b, and 5a-5d are schematic diagrams of a preferred embodiment.

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of various agate information (e.g., stock market data, weather, sports, etc.) Upon user selection (using a click of a mouse or other input means) of a menu item, program 31 displays corresponding up-to-date  
5 information. Similarly, each time the user selects another menu item, program 31 generates and displays current agate information relating to that selection.

In addition, program 31 records the user's selections and his viewing activity with respect to the  
10 agate information. In particular, for each piece of displayed agate information, program 31 records the date and time of user viewing and the format which the user has selected for viewing. After multiple sessions, a pattern of the user's viewing actions or viewing habits  
15 is obtained, from the recorded activity. In turn, certain inferences about the user are made based on the user's viewing habits and the specific pieces of agate information he views, including content and presentation of that information. To that end, for each user the  
20 present invention program 31 creates a user profile from the agate information viewing habits of the user. The system then generates a custom Home Page, including a user's preferred (content and presentation) agate information. On subsequent visits to program 31 (as a  
25 Website) by the user, program 31 displays the customized Home Page for that user instead of the initial Home Page.

Based on the created user profile for a given user, program 31 enables sponsors to better direct their  
30 advertisements and enables advertisements to be tailored to target users' display preferences. That is, both subject matter/content and presentation of advertisements are able to be customized to the end user's preferences due to the information tracked and  
35 recorded (i.e., the created user profile) by program 31.

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agate data assembly 71 to display the Home Page to the new user. Program controller 79 also obtains user identification information from the user to assign a user name and password at the user's convenience.

5 In either case, throughout the session, program controller 79 responds to user selections and viewing actions (screen formatting commands/requests, menu selections, etc.) by (i) using the agate data assembly 71 to obtain and display the requested information and  
10 (ii) using the user profiling member 73 to record the user's activities and thus build a psychographic/behavioral profile of the user.

With respect to the advertisement module 75, program controller 79 obtains sponsor submitted  
15 advertisements from module 75 and generates a screen view formatted according to user preferences as determined from the psychographic profile in the user profiling member 73. That is, program controller 79 enables display of advertisements customized to the  
20 user, as to content and presentation (i.e., colors used, orientation on the screen, audio/video components, and the like). Program controller 79 obtains the content from the advertisement module 75 and the presentation details for the subject user from the user profiling  
25 member 73.

In addition, for each advertisement, advertisement module 75 (and/or user profiling member 73) records (a) the number of times and/or number of users to whom the advertisement has been displayed, (b) the number of  
30 times/users who have requested more information (via a click of a mouse on a corresponding menu selection) regarding the advertisement, and when possible (c) the number of purchases obtained through program 31's display of the advertisement. As such, advertisement  
35 module 75 holds performance data for each advertisement, and hence enables program controller 79 to provide performance reports to sponsors who log on to program

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postal address, telephone number, credit card number, and the like. User Object 37a also provides language, geographic, demographic and lifestyle information about the user. To accomplish this, User Object 37a stores a  
5 separate record for each of the above mentioned information, the collection of records forming the table or data of User Object 37a. Fig. 3b illustrates the fields or records of information employed by User Object 37a in the preferred embodiment.

10 Also for each user, there is a User Computer Object 37b and a User Interface Object 37c. For each user's computer, User Computer Object 37b provides an indication of the limitations and capabilities of the user's computer system. For example, User Computer  
15 Object 37b lists whether the user's system provides audio and/or video display, and what Web browser software is utilized by the user's system. An outline of the table/data set of a User Computer Object 37b in the preferred embodiment is illustrated in Fig. 3c.

20 The User Interface Object 37c provides a unique (preferably numeric) identifier of the user. The User Interface Object 37c also provides indications of categories of interest to the user and a primary screen display for each category customized to that user. The  
25 foregoing information is held in records illustrated in Fig. 3d. In the preferred embodiment, the various categories of interest include stock trading portfolio, sports, news, weather, theater and television schedules, telephone directory, travel data, classified ads and  
30 personals information, and the like. Display preferences include orientation, color scheme, screen quadrant/location and the like, indicated with respect to the category of information. For example, one user may tend to like stock information displayed in tabular  
35 form on a blue background and weather displayed on a map scene. Another user may prefer stock information displayed in a running 1-line quote at the bottom of the

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The User Viewing History Object 37f stores information indicative of the screen views displayed to the user in a session. Specifically, User Viewing History Object 37f records an item identification (either agate or advertisement) and orientation of that item for each item displayed to (and hence viewed by) the user in a session. Orientation is noted relative to a page/screen view or an object identified in the "related object ID" field of the User Viewing History Object 37f. Preferably, orientation is indicated as being top, bottom, left, right or background of the screen view. The Viewing History Object 37f also records an identifier (of each screen view), ordinal sequence number (number order of screen view within series of screen views displayed in a session), and an indication of the action from which this screen view resulted (i.e., a reference to a corresponding User Action History Object 37e). Lastly, the User Viewing History Object 37f records date and time of screen opening and closing for each screen view. The foregoing is stored in an object table record illustrated in Fig. 3g.

Returning to Fig. 3a, the set of Page Display Objects 35a-35c defines the screen views transmitted and displayed to end users. A Page object 35a cross references a User Interface Object 37c which specifies which Page Display Object 35c and which agate information (content and presentation) is appropriate for the current user. Page Data Objects 35b hold the agate or other data to be displayed to end users. Included are advertisements (objects themselves) which may be integrated into the agate data. Preferably advertisements are positioned along the periphery (i.e., above, below, left or right) of the agate data, as defined by a respective Page Display Object 35c. Accordingly, Page Data Objects 35b support Page Display Objects 35c which outline the possible screen content



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symbol/code, stock information and corporate data about a specific company. The "Expert Guide Page" and "Show Me Some Page" formats enable the user to interactively create his own screen display of stock information. In particular, the Expert Guide Page surveys the user on his investment interests. Using the Expert Guide Page and Show Me Some Page formats, Page Display Object 35c then displays names of companies found to match the user provided criteria.

10 In each of the foregoing formats, the preferred embodiment includes incorporation of ads or sponsorship indications as top and/or closing banners. The Home Page 43 (Fig. 4a) provides scores of recent games and news in the "sports" category. If a user selects the sports category from the Home Page, a Page Display Object 35c generates various screens bearing sports information and news. For sports pages/screen views, there are seven page/screen formats of Page Display Object 35c outlined in Appendix I. Briefly, a "General Sports Page" format includes (a) game scores and standings, by league, for professional and collegiate sports, and (b) player standings (professional and collegiate) for baseball, football, hockey and basketball. Statistics are updated and displayed during play of a game, so that the General Sports Page provides game-in-progress statistics in real-time. Also a news window is provided for each sport with a link to a "News Page" (object) for more news. The "News Page" format includes information regarding major trades, signings and injuries. In the preferred embodiment, a scrolling window of latest news is also included.

30 A "Team Page" format provides a roster of a given team. Thus program 31 has several Team Page Display Objects 35c. The roster lists players by name, jersey number, position and some statistics. A "Team v. Team Page" format lists similar information as the "Team Page" format but for two teams in facing columns.

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and advertisements at the bottom of the screen view in the preferred embodiment.

Referring back to the Home Page 43 of Fig. 4a, also included is a Travel Category. Data/information displayed in that category include travel and other ticket purchases of a user within an approaching date and specials advertised in areas of interest to the user. Upon user selection of the Travel Schedule Category of the Home Page 43, a Travel Page Display Object 35c enables display of a Travel Options Page (screen view).

The format of a "Travel Options Page" of the preferred embodiment is detailed in Appendix I. Preferably, there is one Travel Options Page for each of different cities. Briefly, for each Travel Options Page Display Object 35c there are three data parts. A first part is a table of transportation options, including departure, arrival and reservation information for airlines, buses, boats and trains. The second part is hotel information in a given destination (subject city). Preferably this information is in tabular form. The third data part of a Travel Options Page Display Object 35c is information regarding rental car options. Further the Travel Options Page format allows an advertisement to be displayed at the top of the screen view and at the end of a Travel Options Page.

Referring back to Home Page 43, Fig. 4a, the Directory category provides phone numbers typically called by a user. The supporting Directory Page format for this category is a table of names and corresponding mailing addresses (i.e., street, city, state, zip code), telephone and facsimile numbers, E-mail address and URL (universal resource locator). Preferably for those names with an E-mail address, the indicated name functions as a screen menu-selection using hyperlink techniques.

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description, photo, city information and contact information. Advertisements at the beginning and end of the page/screen view are enabled by the "Individual Listings Page" format.

5 In the preferred embodiment, there is also a Media Schedule Object and respective screen view, accessible through the Home Page 43 of Fig. 4a. The format of the Media Schedule Page includes three tables of information--one table for television listings, one for  
10 film listings and one for live performance listings as illustrated in Appendix I. The television table lists for each program (show): the channel airing the program, start and end times, and other related information (e.g., rating, rerun, etc.) For each film, the film  
15 table lists, among other information, cinema where playing, show times, length in time, rating and indication of type of film. The live performance table includes symphony and theater performance schedules (show times) and place/theater.

20 In the preferred embodiment, program 31 displays user generated messages and system generated notices (or warnings) to the end user in addition to the foregoing "Pages"/screen views of category information. Fig. 4b illustrates the preferred Message/Notice Object 45  
25 screen view format. In the case of one user sending a message to another user through program 31, the displayed message includes indications of the sending and intended receiving users along with an identifier, subject and message, among other indicia. Attachments  
30 or additional information are enabled through a page reference (Page ID) and/or link indication. If the recipient selects (by a click of a mouse) the page reference or link indication, program 31 generates a screen view (i.e., Page Display Object 35c) displaying  
35 the additional information. Further messages are transmitted through E-mail or internally/local to program 31.

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(Appendix I). Preferably a Company Page Object is utilized. Thus, corporate information is presented in a table listing company name, and indications of industry, revenues and contact information (street address, telephone/facsimile numbers and E-mail address).

Information about the local weather as accessed from the City Page is preferably presented in a graphical five-day forecast format, similar to that described for the Regional Weather Page Object in Appendix I. Lastly, the City Page provides a Directory of numbers in the subject city which the user has previously accessed and hence are probably meaningful/useful to the user while staying in that city. Each entry in the Directory includes a name, address, telephone/facsimile number, and E-mail address. Also in the preferred embodiment, indications of changes of address are provided in the Directory.

In addition, program 31 enables user customization of content and format of screen views for each category of information. That is, for each of the Home Page and City Page categories (financial information, sports, weather, travel, telephone directory, personals and classifieds), the user is able to request structured data, preformatted data packages and/or value-added analyses from program 31. Thus if a user provides certain data and an indication of desired form of analyses (ranging from a numeric indication to a simple yes/no indication), program 31 provides prepared analytical views for the user selected data in the subject category. Alternatively, program 31 provides prepared profiles to assist users in selecting data. In response to a user providing a simple analytical statement/request, program 31 responds with data that fits that request. For example, if the user requests college stocks, program 31 suggests some. Also direct user selection of category items and display format is enabled through this feature.

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each Ad Package Object 33b (Fig. 5b) there is indicated the sponsor ID, start and end dates and times, and pricing of the ad packages. The pricing may be dependent on the number of times the ad is viewed by users (i.e., a "hit"), number of times a user selects to view more information from the ad (i.e., a "click through") and/or the number of times an actual order is generated. Pricing by the number of hits and number of click throughs by exact numbers or maximum numbers is indicated in the Ad Package Object 33b. Thus Ad Package Objects 33b serve as billing entities for the program administrator. Also Ad Package Object 33b records the number of hits and click throughs as tracked/monitored during user operation of program 31.

Specific to desired ads, each sponsor has one or more Ad Series Objects 33c (Fig. 5c). An Ad Series Object 33c (Fig. 5c) provides an indication of whether a given advertisement is singly or serially displayed, the category of the information, and the demographic group pre-requested by the sponsor to be shown that advertisement. In a preferred embodiment, the sponsor specifies in Ad Series Object 33c the required and/or preferred psychographic and/or demographic criteria and relative importance (e.g., weight) with respect to each criterion. Further, the sponsor specifies in Ad Series Object 33c a minimum total weight of criteria to be met by a user to qualify the user to view the ad series. Also Ad Series Object 33c includes a reference to an Ad Package Object 33b (via an ad package identification), the hour of the day in which the ad/ad series is to start and end, the days of the week on which the ad/ad series is to be displayed, and the beginning and ending dates and times of the ad/ad series. Also for serially displayed advertisements, Ad Series Object 33c indicates the maximum number of views in a series to be displayed per user and per user per day.

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In the Demographic Response Rates Report, all ad packages of a sponsor or selected ones are compared. In particular, the ad success by the sponsor-targeted demographic groups is compared. Further the reporting  
5 subroutine 41 of program 31 calculates a regression on the targeted demographic groups for the ads, and the results of the regression calculation are used to suggest other demographic characteristics that are  
10 number of purchases. The advertiser may also run a complete regression report for all or certain ad packages.

A Psychographic Profiling Report is similar to the Demographic Response Report except a psychographic  
15 profile is used instead of a demographic profile. The reporting subroutine 41 makes regression calculations, and results of the calculations enable program 31 to suggest other psychographic characteristics that are  
20 of the ads for a given sponsor.

Other report formats include a U.S. or world mapping to show user density of program 31 versus a sponsor's click through or purchase density. Traditional regression reporting is also enabled.  
25 Custom reports which allow the sponsor to select ad packages to be analyzed and variables to consider are also enabled by reporting subroutine 41.

Use and operation of the preferred embodiment of the present invention is as follows. The following is  
30 for purposes of illustration and not limitation.

Stored locally on a user's PC is a cookie (technology by Digital Equipment Corp.) for identifying the user and his preferences. The user logs onto the Internet 29 and enters the URL or Website address of  
35 program 31 which initializes main routine 39. The URL request is received by Web server 27 which in turn transmits (a) a login advertisement screen view (i.e.,

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35a,b,c. Main routine 39 transmits the screen view for display to the user.

Program 31 also creates a new User Object 37a, User Computer Object 37b, User Interface Object 37c, User  
5 Session Object 37d, User Action History Object 37e and User Viewing History Object 37f for the new user. User Object 37a records the user-provided name and password used to create the cookie. User Session Object 37d records the login time. User Action History Object 37e  
10 records the selection activity of the user. The User Viewing History Object 37f also registers the open and leave times for the initial login advertisement screen view and notes what elements were displayed at that time. Also the Ad Package Object 33b responsible for  
15 the initial login advertisement screen view records a "hit" by the new user.

Say for example, the new user selected (i.e., "clicked on") the "Stock Data" option from the Home Page. Program 31 responds by displaying a screen view  
20 featuring the exchange prices from various global exchanges. Main routine 39 also enables a banner to appear at the top of the screen reading (for example) "Brought to you by Dean Witter". The user is able to select/click on this banner to effectively request more  
25 Dean Witter information from program 31. To accomplish this, the screen view contains a hyperlink formed of the URL for Dean Witter information on the Internet, and program 31 would list the new user as the requester and the current screen view as the page from which he made  
30 the request.

In the example, the exchange prices screen view also displays two options: "Quick quotation" and "Build a Portfolio". Say the user selects the former and enters a stock symbol. The screen view also prompts the  
35 user to a directory of symbols for use as needed. Near the lower portion of the screen view, there is displayed an area for the user to enter a new stock symbol and an

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required terms and minimum total weight are recorded in Ad Series Objects 33c (Fig. 5c).

To rank the advertisements determined to be appropriate, main routine 39 calculates

$$\text{Rank} = \left( \frac{\# \text{hits purchased}}{\# \text{hits achieved}} \right) \left( \frac{\# \text{clickthrus purchased}}{\# \text{clickthrus achieved}} \right) \frac{1}{t} \text{cost} (1 -$$

5        where #hits and #clickthrus (i.e. number of hits and number of click throughs) purchased and achieved are stored in Ad Package Objects 33b;

      t is time remaining and equals end date/time minus current date/time (from Ad Package Objects 33b); and

10        D is a percentage discount of the cost of the ad package, if the ad package is not completed i.e., number of purchased hits and click throughs is not met.

      In the preferred embodiment, program 31 automates weighting of criteria and in real time adjusts the intended audience profile of advertisements. To that end, program 31 tracks demographic and/or psychographic criteria of users who view ("hit") and/or select (i.e., "click through") advertisements. Then program 31 performs a traditional regression analysis of the tracked criteria, which results in (i) null and alternative hypothesis testing to determine significance (T-test or  $\chi^2$  test) of criteria/variables, and in (ii) squared correlation and squared correlation testing ( $R^2$ ) to determine the weight of each criteria. See D.

25        Freeman, R. Pisani and R. Purves, "Statistics", publishers W.W. Norton & Co., NY 1978 pages 439-444; and Murray Spiegel, "Theory and Problems of Statistics," McGraw Hill, NY 1961 pages 270-273. Program 31 uses the T-score (of the T-test) to weight demographic and/or psychographic criteria and to effectively adjust the minimum total weight recorded in the Ad Series Object 33c (Fig. 5c). Program 31 continually performs the foregoing so as to maximize/ optimize success of advertisements displayed through server 27.



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AcuWeather, and WSI, for example. As described above, the User Interface Object 37c, User Session Object 37d, User Viewing History Object 37f, and Weather Page Object 35 record (a) open and leave times of the weather screen view, (b) indications of what elements were displayed in that view, and (c) indications of what weather elements the user liked to view in his weather page, including national radar maps and 5-day forecasts.

Say the user now logs out. Program 31 notes the total usage time and adds it to the user's usage log. When the user subsequently logs on, Web server 27 locates his cookie, and main routine 39 queries the User Object 37a, User Computer Object 37b and User Interface Object 37c of the user to identify who he is and what his preferences are. In turn, main routine 39 queries the Financial and Weather Page objects of the user and returns with data (screen views) of that last session. Using this data, program 31 automatically generates a Home Page 43 tailored to the user, i.e., lists his portfolio and the weather in his last specified city.

Also the Home Page 43 displays an option to "click here for weather in other areas". Upon the user doing so and entering a home zip code, program 31 records that information in the User Action History Object 37e and User Object 37a (home zip code field). Program 31 also generates a Weather Page/Screen View for the designated zip code area using the Page Objects 35a,b,c as described above.

Next, say the user selects and uses from the Home Page 43 (i) the Directory to look up a business partner in Detroit, and (ii) the Travel option to look up flight schedules. Screen views of telephone directory pages and travel options/tables are generated and displayed using the Page Objects 35 and Ad Package Objects 33b as described before. That is, the Page Objects 35a,b,c (i) assemble the data from a pertinent agate source whose URL is passed in the initial request/option selection,

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(i.e., "clicks on") an advertisement, the corresponding Ad Package Object 33b records a "click through". This affects the ranking and criteria weighting calculations (discussed above) and further refines the terms of elements to be displayed/presented to a user. Thus the present invention provides a means and method for continually refining the target profile for advertisements.

The messages/notices and warnings feature 45 (Fig. 4b) of program 31 enables users to request warnings for all data categories. In the example, say the user requested that a warning be sent to him for changes in stock price of a certain company. In turn, the User Interface Object 37c records the user specified threshold (e.g., change in price per share) and his E-mail address where he can be reached. When the stock data source issues a message that meets the threshold, the user's Warnings/Notices Object 45 (Fig. 4b) sends an appropriate warning. His Warnings/Notices Object 45 also records a "posting date" of the warning. Upon logging onto his Internet mail, the user sees incoming mail (the warning generated and sent from program 31). Upon logging into program 31, the user is presented with the usual Home Page (tailored to that user) but with an indication of an outstanding warning. If the user selects the "warning" option, program 31 employs a "link" (e.g., HyperText technology) to display that part of his stock portfolio which is pertinent to the warning. The Warnings/Notice Object 45 in turn records the user's read date and time.

Similarly, user-to-user messages and/or notices (e.g., special events or new information available through program 31) are provided to a user. User Viewing History Objects 37f and other User Objects 37 may be searched by program administrators to find users to target notices to, depending on category of information and presentation details. For example, if

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real-time, automatic optimization as discussed previously. Under this auto-targeting system, an ad package is shown to general users. After a large number (e.g., 10,000) hits, program 31 runs a regression on a  
5 subject Ad Package Object 33b to see what characteristics are important, and who (type of user profile) the ad appeals to most. Program 31 then automatically enters weighting information based on that regression to create a targeted system and runs the  
10 advertisement (Ad Package Object 33b) again in front of this new targeted group. Program 31 then runs a regression every 10,000 hits, for example, including a group of 500 general people as a control, and adjusts the weighting. This continues until the Ad Package is  
15 exhausted (i.e., the number of hits and click throughs are achieved).

Subsequently when the sponsor-user logs on, the Web server 27 (using cookies if available) identifies the sponsor-user with a user ID stored in the Sponsor Object  
20 33a (Fig. 5a). Preferably, separate cookies are used to identify the user's personal login apart from that of the user as an agent of a sponsor-company. Also program 31 begins recording page information for the sponsor, and begins building a demographic and psychographic  
25 profile and usage history upon the sponsor-user entering the system.

Using page Objects 35, program 31 displays an initial screen view and prompts the user for a user name and password. The sponsor-user enters the Company's  
30 user name and their password. In response, main routine 39 checks the set of Sponsor Objects 33 and determines this to be the first "visit" since the sponsor placed a new ad. In turn main routine 39 omits displaying the main menu (for sponsor-user) having options to place a  
35 new ad, check existing ads, or go to Home Page. Instead main routine 39 uses Page Objects 35 and displays the existing ads section which offers a "reporting" option.

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corresponding Sponsor Object 33a for the company's SIC code and industry description. Recognizing a match, program 31 places the other company's ad on the report screen view displayed to the sponsor-user. If the sponsor-user clicks on the ad, program 31 records the hit for the other company's advertisement, just as it would with any other end user. As such, program 31 tracks advertiser usage as user information and develops demographic profiles for advertisers. This data is stored in the sponsor's Users Objects 33a (Fig. 5a). When the sponsor-user of the example decides to create a second package, the sponsor-user clicks on a "request an ad package" option and completes a form detailing the package (number of hits/click throughs requested, profiling, etc.). This time however the sponsor-user decides not to identify a target market for this ad. Impressed by the system's regression information, the sponsor-user decides instead to choose "auto target" and allow program 31 to make the most efficient use of the new ad. Graphics of the new ad are "pasted" onto the form and submitted to server 27.

In response, program 31 creates a new Ad Package Object 33b and links it to the company's existing Sponsor Object 33a. From the data entered into the form, main routine 39 completes the corresponding Ad Package Object 33b, Ad Series Object 33c and Ad Object 33d. In turn, program 31 displays a price quote for running the ad, and the sponsor-user clicks on the "accept" button. This advertisement package becomes available as soon as the sponsor-user has clicked on the "approved" button.

Subsequent login to program 31 completes a similar query to the one above, this time checking for both of the sponsor's advertisements. Reporting subroutine 41 generates a report listing the successes of the ads in two columns of a table. To accomplish this, subroutine

old women tend to purchase frequently and respond to their still, forest green colored advertisements most often, program 31 allows sponsors to place that type of ad in front of the subject target market segment during a reporting cycle. Thus, program 31 enables updating of the Sponsor and Ad Objects 33 during a reporting cycle to accommodate the foregoing.

With respect to reporting, if the reports of program 31 show that customers respond to still advertisements more often than moving ones, bright colors more often than darker ones, graphics rather than text, large text rather than small, detailed text or square advertisements rather than bar style ones, such is relayed to the sponsors/ advertisers.

To achieve the foregoing analysis, program 31 classifies aspects of each advertisement (see Ad Objects 33d, Fig. 5d). In a preferred embodiment, such classification is automatically provided by a subroutine of main routine 39. In turn, this allows direct user behavior analysis and psychographic profiling.

#### Equivalents

While the invention has been particularly shown and described with reference to a preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

For example, the term "page" is used synonymously with screen view.

In the foregoing discussed example, description of generation of weather, stock, travel and directory pages is provided. Page/screen view and supporting objects in other categories of information are similarly generated.

The use of the term "program administer" singularly or in plural is intended to refer to people who operate

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all in comparable columns. Joe could also switch to CAGR numbers (Compound Annual Growth Rate, pre-processed by program 31) which allow easier comparisons. Another click (i.e., command/selection) and Joe downloads these  
5 as a spreadsheet.

Both stock and company data can also be processed through a few calculations to produce standard business ratios (i.e., price-to-earnings, etc.). Some of these can be pre-processed; some must be done in real-time as  
10 they include stock price.

Alerts: For users who are comfortable giving out their E-mail address, the program 31 will send alerts at preset stock prices for stocks in their portfolio list or their "track these" list. E-mail's will be sponsored  
15 and will correspond to the "New Items" section on a user's personal page.

#### Weather

Program 31 uses the weather to determine, in part, where users live and where they are going. As such,  
20 program 31 enables users to see the weather in 1, 2 or 3 places they are or would like to be. Thus, another program feature allows users to view weather from more than one place simultaneously.

Program 31 typically gives users a quick glimpse at  
25 the 5-day forecast on the login page, with additional information about their local area or others in map format, graphical images (e.g., a snowflake), and data. Weather summaries may be available (short text blurbs) for larger regions, and possibly for individual cities.

30 The greatest challenge here is how to locate the user. This can be done either with maps, zip codes/postal codes or by city (selectable lists which change by country). Alternatively, it is desirable to have a clickable map which allows the user to get to  
35 their location within 2 clicks. Also the system may offer a shortcut where the user can do it by postal code

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Travel Information

Travel information will include various modes of travel, their schedules (departure/arrival times, perhaps including layovers/transfers), and, when  
5 available, costs for tickets (by class) and, if possible, ticket availability information. This is a natural lead-in to on-line bookings. Preferably, program 31 accommodates additions of new carriers and perhaps a section on hotels. Where possible, program 31  
10 would give users the cost of a seat on that flight, and availability of seats in a specific category.

Alerts: Users will be alerted to weather in towns they are traveling to, airport closings, etc. (Weather Objects may include this.)

15      Telephone Directory

Users will be able to define a name (first, last), address (city, state, zip), and find all published numbers that match (limited to 100/display, but users can go through more than 1 page of 100). Entire lists  
20 can be downloaded into a tab-delimited file with name, address and phone. Users can keep a directory of most called numbers on server 27. Users will receive alerts if someone on their list is no longer listed at the old address.

25      Visitors to server 27 will have the ability to add E-mail information to their directory information. This will be recorded so long as they maintain the same location. If they move, they will have to re-enter their E-mail address.

30      Program 31 will also maintain a list of "where are they now" numbers and addresses, i.e., a list of changed addresses and telephone numbers which is searchable in a similar fashion.

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advertisements easily, perhaps by entering a system-provided code.

### Reports

5     Sponsor-user requested reports are generated at the time of request as described above. A real-time report (e.g., JAVA format) would show changes as they occurred during a requested report.



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## Message Window

List of quickly moving companies/alerts

List of expert articles

## Tracking List

5 (like portfolio, replacing purchase price with  
"initial tracking value")

Indices (graphed, listed or value by daily change  
pointer)

Dow Jones Industrial Average

10 NASDAQ

Other indices

Custom Ticker

Closing Banner

## Format 2. Company Page

15 Top Banner

SIC Industry code and industry name.

Stock information

Graph of change

Table compares these with 3-5 companies in similar

20 SIC group

Last traded at...price

Day/time of last trade

\$ change

% change

25 volume

# trades

open

prev. close

bid

30 ask

day low

day high

52 week low

52 week high

35 EPS

P/E

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Disclaimer  
Bottom banner

Format 5. Show Me Some Page

Top banner  
5 Text description of what page does  
Table of stocks (generated from where the call for  
the page came from)  
Disclaimer  
Bottom banner

10 Types of Weather Pages

Format 1. National Weather Page

Top banner  
Maps  
National/Continent Weather Photos & Maps  
15 Satellite view  
Temperature changes  
Precipitation map  
UV index  
Textual description of the fronts  
20 Real audio from a celebrity reading his/her  
forecast  
Bottom banner

Format 2. Regional Weather Page

Regional (state-sized regions) photos & maps  
25 Satellite view  
Temperature changes  
Precipitation map  
UV Index  
5-day graphical forecast  
30 high temp  
low temp  
precip (sunny, partly cloudy, partly sunny,  
mostly cloudy, cloudy, rain/snow)

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## Format 3. Team Page

Top ad  
Team name  
Team logo (if permission granted)  
5 Roster  
Player names  
Player numbers  
Player position  
Short stats list

10 Bottom ad

## Format 4. Team v. Team Page

Top ad  
Table - 2 columns  
Team names & team logos (if permission  
15 for BOTH)  
Team rosters, with players opposite one  
another  
Performance stats in competition  
Odds-makers bets on coming games  
20 Ticker with game scores for entire season  
Bottom ad

## Format 5. Player Page

Name  
Team name  
25 Position  
Stats list  
Runs scored (season)  
RBI  
Batting average

## 30 Format 6. Player v. Team Page

Top advertisement  
Player name and team name  
Player stats against this team only (table)

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	Transport type
	airline
	bus
	boat
5	train
	Schedule
	Departure
	city
	time
10	Stops (could be multiple)
	city
	arrival time
	departure time
	Arrival
15	city
	time
	Reservation Information
	seats available
	cost/ticket
20	restrictions
	requirements
	passport?
	visa
	photo ID
25	number to call for reservation
	Table with room and board options in
	destination
	Hotels
	name
30	address
	price/night
	weekday
	weekend
	max # in room
35	bedding
	king (number?)
	queen (number?)

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weight  
height  
Ad text  
End of page ad

5 Classifieds Page

Beginning of page ad  
Response from search  
Item name  
Make  
10 Model  
Price  
Year  
Available date  
Description  
15 End of page ad

Real Estate Pages

Format 1. Citywide Listings Page

Beginning of page ad  
Table showing  
20 address  
price  
dwelling type  
square footage  
price/sq.foot  
25 End of page ad

Format 2. Selected Listings Page

Top Ad  
Table (includes only those listings selected  
by the user)  
30 Table including  
address  
price  
square footage  
price/sq.foot

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central air?

available date

Textual Description

Contact information for house

5 Owner/agent name

telephone

E-mail/program 31 messaging

Photo (if paid advertisement)

Floor plan (if paid advertisement)

10 Map of city with house marked (using 9 digit

zip)

End of page ad

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## APPENDIX III

User Customized Categories

## Financial Information

Data from two primary sources

5           S&P Comstock from variety of exchanges.  
(Note some of these items may not be  
available.)

          last traded at  
          day/time of last trade  
10         \$ change  
          % change  
          volume  
          # trades  
          open  
15         prev. close  
          bid  
          ask  
          day low  
          day high  
20         52 week low  
          52 week high  
          EPS  
          P/E  
          Market cap  
25         beta  
          Dividend and ex  
          5 year EPS growth  
          currency

          Ticker-company translator  
30         EDGAR

          revenues  
          earnings  
          product descriptions

Preformatted data analysis for user profiles

35         bid  
          ask

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analysis and you give me the data that fits it  
(I want college stocks and you suggest them).

Like TurboTax software

ADD info from here to user profile

5 Direct User Selection of categories and  
display (like TERMS)

## Sports

### Sports stats

10 initially for big 4 professional leagues  
eventually adding college and golf, tennis,  
auto and horse racing

preformatted data packages include

daily report on selected team/player stats

value-added analysis tools and data

15 Prepared analytical views by experts. Program  
administrator will try to get sports  
personalities from major cities nationwide as  
well as a few national sportscasters. The  
program administrator will allow users to  
20 follow those they find compelling.

What info do you want

Sports personality ratings (for every team;  
based on what Terry believes is important, for  
the teams the user likes)

25 e.g. by Dan Deardorf

by Stan Savrin

by Terry Bradshaw

includes the categories important to  
the analyst and their thumbs-up or  
30 thumbs-down stat

overall rating by Dan defensively, etc.

Prepared profiles to assist users in selecting  
data. I give you my easy walk-through analysis and  
you give me the data that fits it (I want football  
35 teams and a simple comparison, you suggest them).



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Direct User Selection of categories & display (like  
TERMS)

Warnings/Notices

5        Severe weather in their area or other areas they  
         monitor

         Good weather coming in potential vacation spots

Travel

         data

10        centered on "from:" and "to:" cities  
         include schedules, pricing and seating class  
         availability for airlines, buses and trains

         preformatted data packages

15        allow user to simply select two cities  
         (airports), date and time (optional) of  
         travel, and view their travel options.

         Sortable by time, cost, seating available  
         value-added analysis tools and data

20        Featured travel packages prepared by travel  
         experts  
         Prepared profiles to assist users in selecting  
         data

         Easy walk-through analysis and program 31  
         gives the data that fits

25        What city are you in?  
         Where do you want to go?  
         When do you want to travel?  
         What's your greatest priority?

         cost

         convenience

30        non-stop

         ADD this information to user profile  
         Direct user selection of potential  
         flights

         warnings/notices

35        discount fares to cities the user has  
         examined;

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smoker/non

cook?

- Prepared profiles to assist users in entering data and giving importance to their data items. Easy walk-through analysis
- 5 Helps users to input their info (automatically lists them on network if they like, allowing anonymous entries and replies)
- 10 Completes search
- Helps user send message
- Direct user selection through browsing or complex searching
- Warnings/notices
- 15 responses to ads placed
- "most interesting singles ad of the week"
- Oprah's latest recommendation for you

#### Classifieds

- data entered by users
- 20 data entry uses preformatted forms with many optional categories (depending on product selected)
- product
- cost
- size
- 25 weight
- doors (2 or 4)
- horsepower
- cylinders
- negotiable?
- 30 manufacturer
- age/year of purchase
- warranty?
- location of item
- text description
- 35 value-added analysis tools and data

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## APPENDIX IV

Advertiser Reporting Features

Web-based reporting includes advertisements  
targeting the advertisers

5 Please contact me...I want to advertise on server

27

Place/delete ad packages (for existing accounts  
only)

Reporting

10 Allows drill-down through to individual user  
level

Types of Reports

1. Overview of program 31 advertising

Broken down by ad packages

15

Shows

HTs purchased and achieved

CTs purchased and achieved

Purchases (if applicable)

Cost of package

20

Date specified by package

Can click through to detailed  
package reports

2. Detailed Package Reports (for individual  
packages)

25

Shows ads included in package

Media (visible/playable here)

HTs purchased and achieved

CTs purchased and achieved

Purchases (if applicable)

30

Cost of package

Demographic profiling requested

Demographic breakdown of success v.  
control group

3. Demographic Response Rates

35

Includes all packages or selected ones

Compares (if several) ad success by

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CLAIMS

1. In a computer network formed of a communication channel and a plurality of digital processors coupled to the communication channel for communication thereon, computer apparatus comprising:
  - 5 a data assembly for providing agate information to users of the computer network, in response to a user request the data assembly transmitting desired agate information across the communication channel to one of the digital
  - 10 processors for display of the desired information and viewing by the user; and
  - a tracking and profiling member responsive to the data assembly, in response to a user viewing
  - 15 agate information obtained through the data assembly, the tracking and profiling member recording indications of user viewing activity with respect to the agate information and therefrom providing a psychographic profile of the user.
- 20 2. Apparatus as claimed in Claim 1 wherein the data assembly provides at least one of stock and market data, theater and television schedules, sports statistics, weather information, travel information and Directory information.
- 25 3. Apparatus as claimed in Claim 1 wherein:
  - the tracking and profiling member records
  - format preferences of users with respect to
  - presentation of certain agate information, the
  - format preferences including color schemes,
  - 30 text size and shapes; and
  - in response, the data assembly displays
  - agate information to a user (a) in a manner
  - customized according to the format preferences

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times viewed by a user, (ii) number of times selected for further information, and (iii) number of times a purchase was obtained through the advertisement.

5 8. Apparatus as claimed in Claim 7 further comprising a subroutine coupled to the advertising component for performing a regression analysis on the history of users viewing the advertisements, and therefrom  
10 the subroutine refining the advertisement target profiles of desired users to whom to display the advertisements.

9. In a computer network formed of a communication channel and a plurality of digital processors coupled to the communication channel for  
15 communication thereon, a method for forming user profiles comprising the steps of:

providing agate information for viewing by users of the network;

20 for each user, recording history of user activity with respect to agate information;

from the recorded history, forming user profiles of the users, each user profile providing an indication of categories of interest to the user and display preferences for each category.

25 10. A method as claimed in Claim 9 wherein the step of providing agate information includes providing at least one of stock data, media schedules, sports news, weather information, travel information, and directory information.

30 11. A method as claimed in Claim 9 wherein the step of providing agate information includes displaying advertisements to users by (i) providing advertisements, (ii) for each advertisement,

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(c) transmitting each of the certain pieces of information across the communication channel such that each is displayed only to users having a profile substantially matching the respective initial profile of the certain piece of information;

(d) recording computer activity of users viewing the certain pieces of information;

(e) redefining the initial profiles of target users based on a regression analysis of the recorded computer activity of users, said redefining forming respective adjusted profiles of target users for each of said certain pieces of information; and

(f) continually repeating steps (c) through (e) with the adjusted profiles of the certain pieces of information, such that the certain pieces of information over time, become better targeted to users having an interest in said information and hence said method is self-tailoring.

14. A method as claimed in Claim 13 wherein the step of providing a source of information includes providing agate information.

25 15. A method as claimed in Claim 13 wherein the step of providing a source of information further includes providing advertisements as the certain pieces of information.

30 16. A method as claimed in Claim 15 wherein the step of setting respective initial profiles of target users includes allowing sponsors of the advertisements to indicate relative importance of demographic and psychographic criteria of target users.

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of the advertisement upon a user viewing the advertisement, such that the target profiles of the advertisements are refined in real time.

23. A method as claimed in Claim 17 wherein the step of  
5 transmitting includes (a) determining  
appropriateness of each of the certain pieces of  
information with respect to each user, by matching  
the weighted demographic and psychographic criteria  
to characteristics of the profile of the user, upon  
10 a total score of the matching meeting a predefined  
minimum desired score, the piece of information  
being determined to be appropriate for the user;  
and (b) ranking the certain pieces of information  
determined to be appropriate with respect to a user  
15 such that said ranked certain pieces of information  
are transmitted in order to the subject user.
24. A method as claimed in Claim 23 wherein the step of  
redefining profiles of target users is performed in  
real time of subject users viewing the certain  
20 pieces of information, such that the step of  
determining appropriateness constantly updates  
which of the certain pieces of the information is  
to be transmitted to each of subject users.
25. A method as claimed in Claim 13 wherein the step of  
25 redefining the profiles of target users includes  
performing the regression analysis in real time of  
users viewing and interacting with the certain  
pieces of information, such that the profiles of  
target users are redefined throughout transmission  
30 and display of the certain pieces of information in  
the computer network.
26. A method as claimed in Claim 13 further comprising  
the step of defining, for each user, a user profile

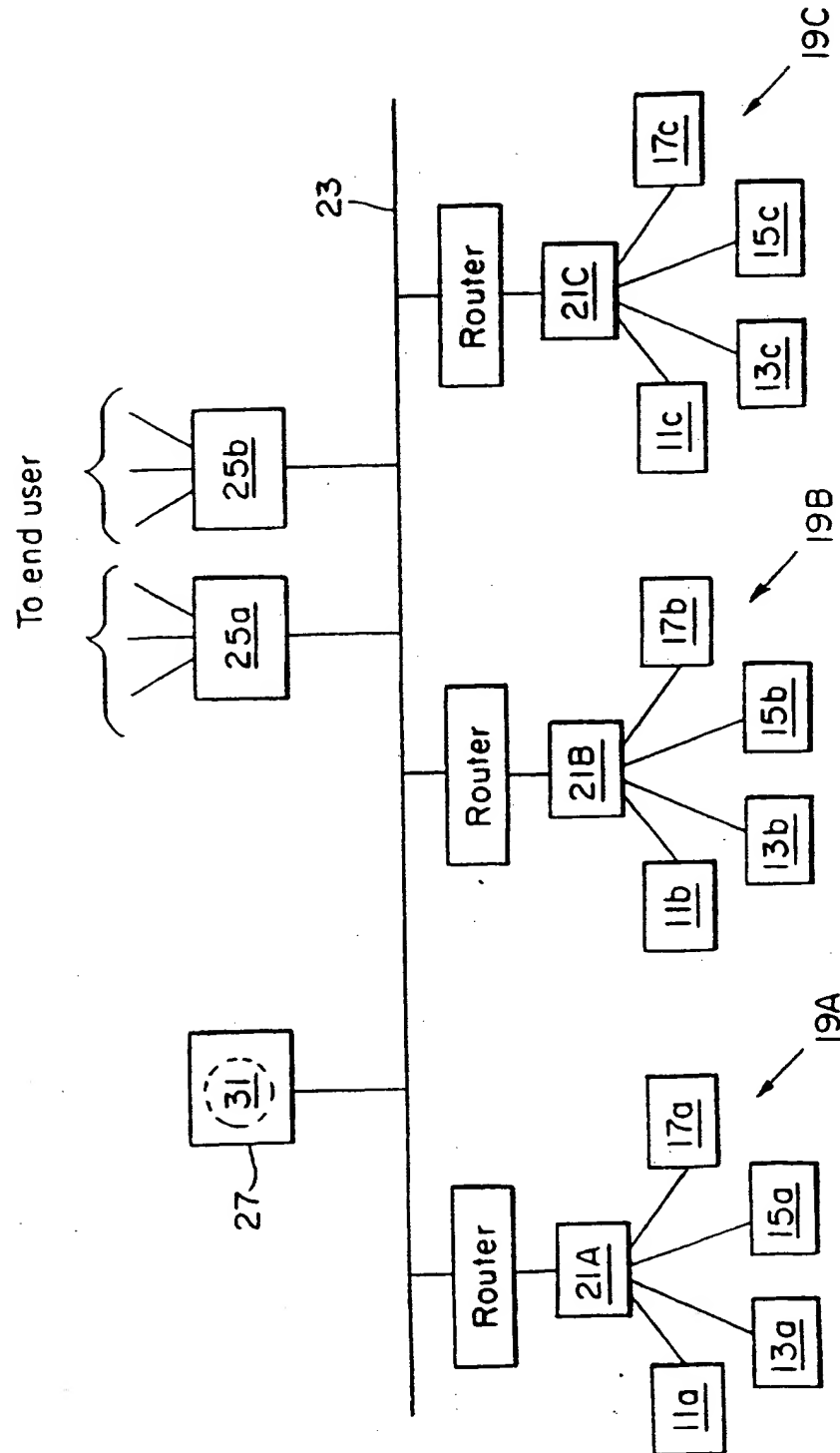


FIG. 1



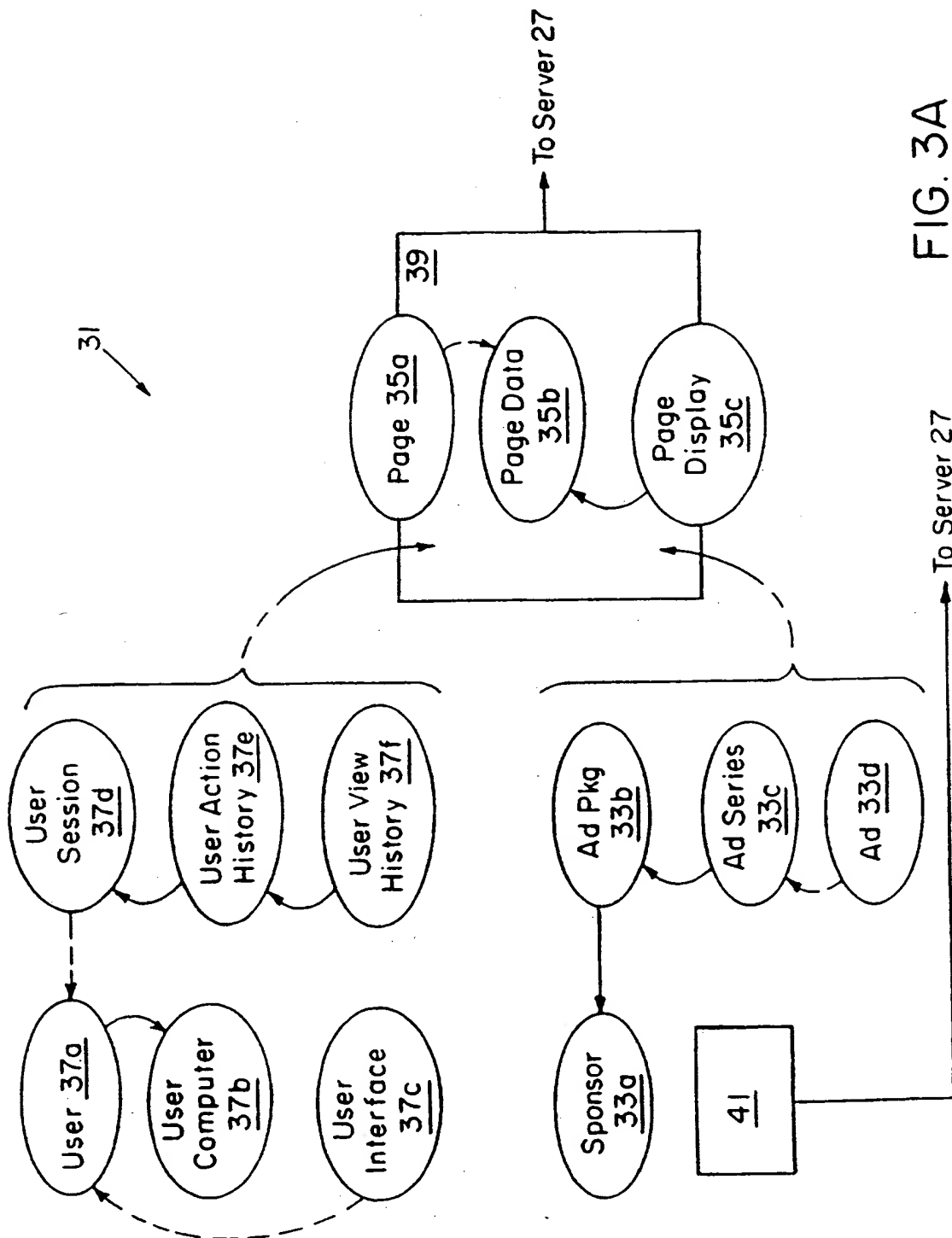


FIG. 3A

5/10

enabling technologies  
 (use/don't use flag for each for this user) Even if don't  
 use, track presence for advertiser reporting.

helper apps list - can user hear audio,  
 video, what browser

plug-ins list

NLO list

persistent ActiveX objects

37b

FIG. 3C

### *User Interface Profile*

User computer ID

categories

category display

37c

FIG. 3D

### *User Session*

referring link

start datetime

end datetime

computer ID

browser type

37d

FIG. 3E

### *User Action History*

action datetime

session ID

*ordinal sequence identifier*

page ID

object clicked ID

*object position on page*

*what was the context of the object that  
 precipitated the action*

*1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> item?*

*Right or left side*

37e

FIG. 3F

7/10

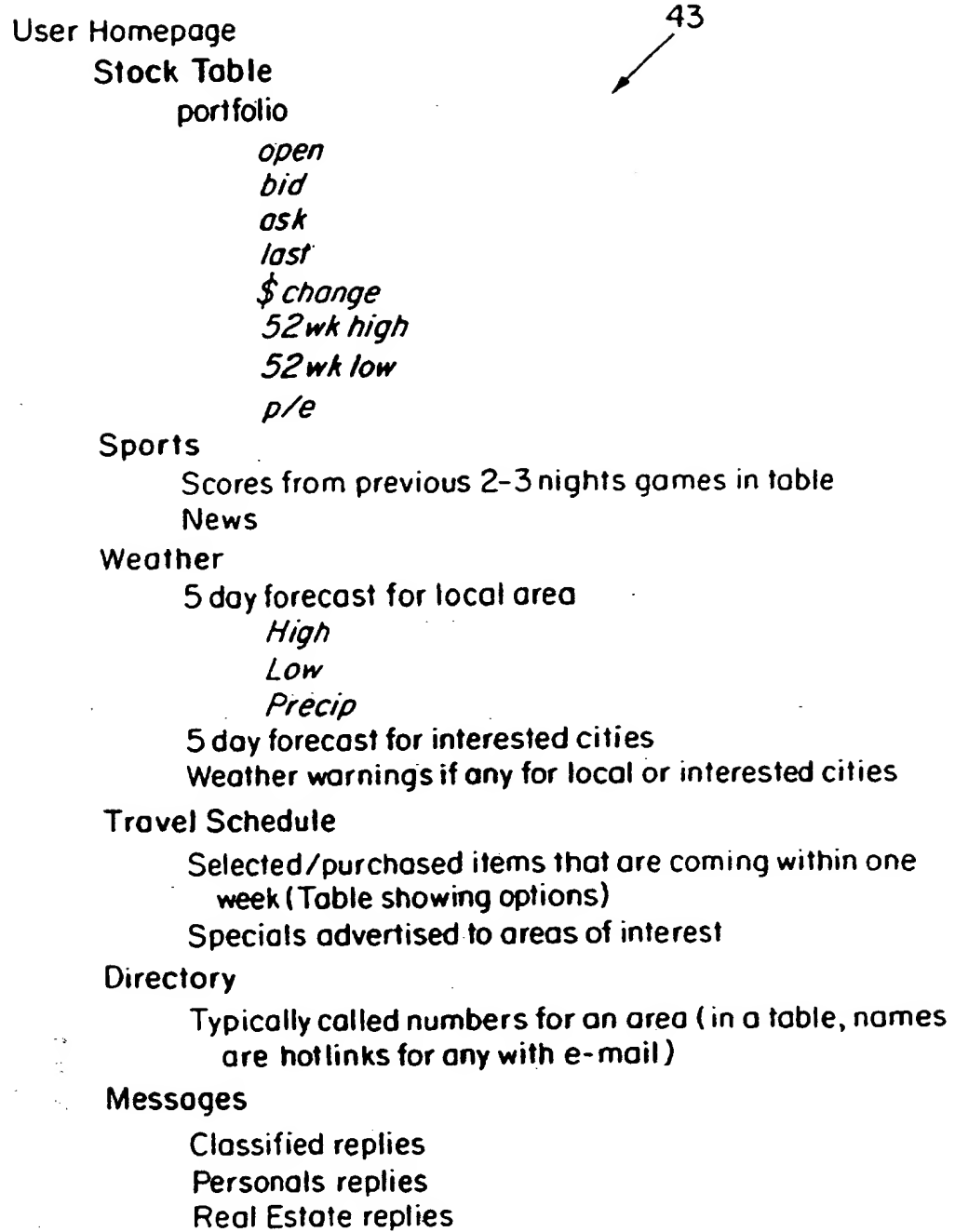


FIG. 4A

9/10

***Ad Package***

Sponsor ID

Info for exact # purchases

Number of Purchased Hits

Number of Purchased Clickthroughs

Info for scaled purchases (up to ...)

Max Hits

Max Clicks

Start Datetime (if not present, active until end date)

End Datetime (if not present, is active after start date)

# hits (derived)

# clicks (derived)

pricing of ad package

hit

clickthrough

order

33b

FIG. 5B

***Ad Series***

package ID

intended demographic profile(s) list

category (product/service)

daily start time-hr. of day

daily end time

Display Days of week

Start Datetime (if not present, active until end date)

End Datetime (if not present, is active after start date)

Max. series views per user

Max. series views per user per day

33c

FIG. 5C

PCT

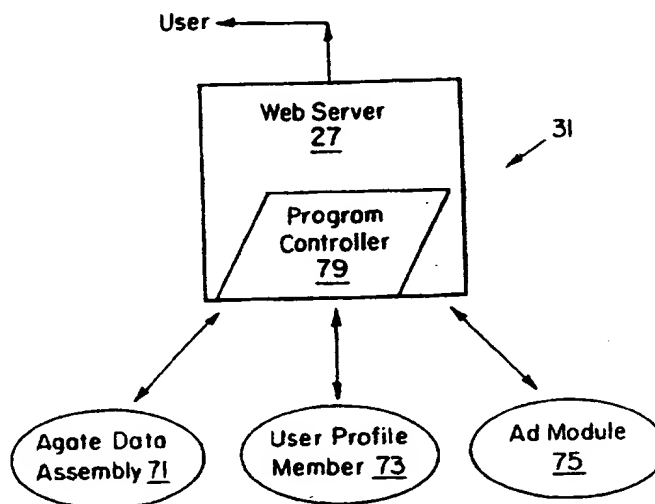
WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: <b>PCT/US97/06767</b> (22) International Filing Date: 22 April 1997 (22.04.97) (30) Priority Data: 08/634,900 26 April 1996 (26.04.96) US (71) Applicant: <b>FREEDOM OF INFORMATION, INC. [US/US];</b> Suite 1, 248 Franklin Street, Cambridge, MA 02139 (US). (72) Inventor: <b>GERACE, Thomas, A.;</b> Suite 1, 248 Franklin Street, Cambridge, MA 02139 (US). (74) Agents: <b>WAKIMURA, Mary, Lou et al.;</b> Hamilton, Brook, Smith & Reynolds, P.C., Two Militia Drive, Lexington, MA 02173 (US).		(81) Designated States: CA, IL, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> (88) Date of publication of the international search report: 5 February 1998 (05.02.98)

(54) Title: **COMPUTER NETWORK AND METHOD FOR DETERMINING USER BEHAVIOUR**



(57) Abstract

Computer network method and apparatus provides targeting of appropriate audience based on psychographic or behavioral profiles of end users. The psychographic profile is formed by recording computer activity and viewing habits of the end user. Content of categories of interest and display format in each category are revealed by the psychographic profile, based on user viewing of agate information. Using the profile (with or without additional user demographics), advertisements are displayed to appropriately selected users. Based on regression analysis of recorded responses of a first set of users viewing the advertisements, the target user profile is refined. Viewing by and regression analysis of recorded responses of subsequent sets of users continually auto-targets and customizes ads for the optimal end user audience.

# INTERNATIONAL SEARCH REPORT

Internat. Application No.  
PCT/US 97/06767

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 6 H04L29/06 G06F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 H04L G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 446 891 A (KAPLAN CRAIG A ET AL) 29 August 1995	1,2,9, 10,13, 14,18, 19,25,26
Y	see column 1, line 12 - line 16 see column 2, line 20 - line 44 see column 5, line 7 - line 20 see column 13, line 5 - column 14, line 48	3-6,11, 15,27 7,8,12, 16,17, 20-24,28
A	---	-/--

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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\*A\* document member of the same patent family

Date of the actual completion of the international search

28 October 1997

Date of mailing of the international search report

06.11.97

Name and mailing address of the ISA  
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Fax: (+31-70) 340-3016

Authorized officer

Vaskimo, K

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/US 97/06767

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5446891 A	29-08-95	NONE	
US 5504675 A	02-04-96	CA 2155887 A	23-06-96
WO 9523371 A	31-08-95	US 5655116 A	05-08-97
		US 5600831 A	04-02-97
		CA 2161233 A	31-08-95
		EP 0696366 A	14-02-96
		JP 9503088 T	25-03-97

## INTERNATIONAL SEARCH REPORT

Intern. Appl. No.  
PCT/US 97/06767

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	D. RAGGETT: "A review of the HTML + document format" COMPUTER NETWORKS AND ISDN SYSTEMS, vol. 27, no. 2, November 1994, pages 135-145, XP004037984 see abstract see paragraph 1.	3,4
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